

REMARKS

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 1-7, 9-20 and 22-26 are now pending in the application. Claims 8 and 21 have been cancelled. Claims 1, 2, 9, 11, 14, 22 and 24 have been amended. Claims 1 and 14 are independent. No new matter has been added with these amendments. Support for these amendments is found at page 3, line 24 to page 4, line 1 of the specification and in original claims 8, 9, 10, 21, 22 and 24. Reconsideration of this application, as amended, is respectfully requested.

Claim Objections

Claim 2 stands objected to because of a minor informality. Specifically, Examiner objects to the claim being two sentences in length. Applicants have amended claim 2 in order to incorporate both sentences of the claim into one, thus rendering the Examiner's objection moot. Withdrawal of this objection is respectfully requested.

Claim Rejections Under 35 U.S.C. § 112, First Paragraph

Claims 8-12 and 21-25 stand rejected under 35 U.S.C. § 112, first paragraph because the specification, while being enabling for a carbon nanocapsule thin film having a carboxyl functional group, does not reasonably provide enablement for any other functional groups. This rejection is respectfully traversed.

As disclosed in page 5, lines 9-24 of the specification, the carbon nanocapsules of the invention comprise a functional group, for example, a functional group that carries at least one positive charge after dissociation in the electroplating solution. The types of functional groups are, for example, an amine or quaternary ammonium group. Furthermore, the carbon nanocapsules further comprise a functional group that carries at least one negative charge after dissociation in the electroplating solution. The types of functional groups are, for example, carboxyl group, SO_4^- or PO_4^- .

Although the present specification describes a carbon nanocapsule thin film having a carboxyl functional group, one of skill in the art understands that other functional groups can be added to the carbon nanocapsule. For example, referring to U.S. Publication No. 2004/0126303 (in the name of the same inventor), an amine or quaternary ammonium group is bonded on the carbon nanocapsule by the cycloaddition reaction (see paragraph [0016]) and SO_4^- is bonded on the carbon nanocapsule by the radical reaction (see paragraph [0017]) via the double bonds on the surface of the carbon nanocapsule. Accordingly, the other functional groups such as an amine or quaternary ammonium group, SO_4^- or PO_4^- can be bonded on the carbon nanocapsule. In light of the above remarks, reconsideration and withdrawal of the rejection under 35 U.S.C. § 112 are respectfully requested.

Claim Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1-6 and 14-19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Nakamoto (U.S. Publication No. 2002/0060514); claims 1-7 stand rejected under 35 U.S.C. 102(b) as being anticipated by Gogotsi et al. (U.S. Publication No. 2002/0141934); claims 7, 13 and 26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Nakamoto or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Nakamoto; and claim 20 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamoto. These rejections are respectfully traversed.

Independent claim 1 and 14 of the present invention clearly identify the carbon nanocapsules comprising a functional group and the functional group carrying at least one charge after dissociation.

Distinctions Over Nakamoto

As disclosed in page 3, line 24 to page 4, line 2, and page 5, lines 4-6 of the specification of the present invention, the charged functionalized carbon nanocapsules can be uniformly electroplated onto a substrate because the charge of the functional group on carbon nanocapsules can be driven by an external electric field. However, the fullerenes or carbon nanotubes of

Nakamoto is a neutral material and has no charged functional group. The fullerenes or carbon nanotubes of Nakamoto cannot be driven by an external electric field. Therefore, the fullerenes or carbon nanotubes of Nakamoto cannot be uniformly electroplated onto a substrate and only can be deposited into a film. In addition, the film of Nakamoto formed by depositing the fullerenes or carbon nanotubes has no bonding forces, thus it is weaker than the film of the claimed invention formed by electroplating.

Accordingly, as Nakamoto never teaches or suggests the limitation of “the carbon nanocapsules comprising a functional group and the functional group carrying at least one charge after dissociation” of claims 1 and 14 of the present invention, Applicants therefore believe that claims 1 and 14 of the present invention are novel and non-obvious over Nakamoto. Insofar as claims 2-7, 13, 15-20 and 26 depend from the independent claims, these claims are also believed to be allowable at least by virtue of their dependency.

Distinctions Over Gogotsi

Independent claim 1 clearly identifies the carbon nanocapsules comprising a functional group and the functional group carrying at least one charge after dissociation.

Gogotsi fails to disclose carbon nanocapsules comprising a charged functional group. Instead, as disclosed in the specification and figures of Gogotsi, the graphite polyhedral crystal has no charged functional group. Therefore, the graphite polyhedral crystal of Gogotsi can not be uniformly electroplated onto a substrate to form a film.

Thus, Gogotsi never teaches or suggests the limitation of “the carbon nanocapsules comprising a functional group and the functional group carrying at least one charge after dissociation” of claim 1, and Applicant therefore believes that claim 1 is novel and non-obvious over Gogotsi. Insofar as claims 2-7 depend from claim 1, these claims are also allowable at least by virtue of their dependency.

Claim Rejections Under 35 U.S.C. § 103

Claims 8-12 and 21-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamoto in view of Murphy et al. (U.S. Patent No. 6,399,785, hereinafter “Murphy”) or Hinokuma et al. (U.S. Publication No. 2002/0187403, hereinafter “Hinokuma”). These rejections are respectfully traversed.

As disclosed in Murphy or Hinokuma, the functional groups of fullerene derivatives or carbonaceous material derivatives do not carry a charge after dissociation. Therefore, the fullerene derivatives or carbonaceous material derivatives of Murphy or Hinokuma cannot be uniformly electroplated onto a substrate to form a film. Thus, these secondary references do not account for the deficiencies of the primary reference of Nakamoto.

Therefore, since Murphy and Hinokuma also do not teach or suggest the limitation of “the carbon nanocapsules comprising a functional group and the functional group carrying at least one charge after dissociation,” and Applicants believe claims 1 and 14 of the present invention are in condition for allowance.

Claims 8-12 and 21-25 ultimately depend from independent claims 1 and 14, respectively, and thus include the aforementioned elements that are novel and non-obvious over Nakamoto in view of Murphy or Hinokuma. Thus, these claims are also in condition for allowance.

CONCLUSION

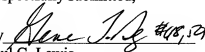
In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Paul C. Lewis, Reg. No. 43,368, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

Dated: June 18, 2008

Respectfully submitted,

By  #43,368

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